

What is claimed:

1. An osmolarity measuring system, comprising:
  - a measurement chamber configured to receive a volume of fluid and to receive a lens, the lens configured to carry a certain amount of tear film;
  - a series of electrodes configured to measure the electrical properties of fluid in the measurement chamber;
  - a processing device coupled to the series of electrodes, the processing device configured to detect a change in the electrical properties of the fluid in the measurement chamber when a lens is placed in the measurement chamber.
2. The osmolarity measuring system of claim 1, wherein the processing device is configured to correlate the change in electrical properties with an osmolarity measurement.
3. The osmolarity measuring system of claim 1, further comprising a plurality of electrode pairs, the plurality of electrode pairs configured to measure the electrical properties of the fluid.
4. The osmolarity measuring system of claim 1, wherein the pair of electrodes is configured to avoid direct contact with the lens when the lens is placed in the measuring chamber.

5. The osmolarity measuring system of claim 1, wherein measuring the electrical properties comprises measuring the electrical conductivity, or complex impedance of the fluid.

6. The osmolarity measuring system of claim 1, wherein the fluid is deionized water.

7. The osmolarity measuring system of claim 2, further comprising a display coupled with the processor, wherein the processor is further configured to display the osmolarity measurement on the display.

8. The osmolarity measuring system of claim 2, further comprising a memory coupled with the processing device, the memory configured to store a table that maps electrical properties with osmolarity values, and wherein the processor is configured to correlate the change in electrical properties with an osmolarity value using the table.

9. The osmolarity measuring system of claim 8, wherein the table is configured to account for a baseline osmolarity associated with the volume of fluid that the measurement chamber is configured to receive.

10. The osmolarity measuring system of claim 9, wherein the memory is configured to store a plurality of osmolarity measurements.

11. The osmolarity measuring system of claim 10, wherein the memory device is removable.

12. The osmolarity measuring system of claim 10, wherein the processor is further configured to track trends in the plurality of osmolarity measurements.

13. The osmolarity measuring system of claim 12, further comprising an indicator to tell the user to perform an action.

14. The osmolarity measuring system of claim 13, wherein the indicator comprises at least one of a display, an LED, a plurality of lights, or an auditory signal.

15. The osmolarity measuring system of claim 13, wherein the indicator is configured to indicate a type of artificial tears to administer.

16. The osmolarity measuring system of claim 13, wherein the indicator is configured to indicate a type of medication to administer

17. The osmolarity measuring system of claim 13, wherein the indicator is configured to indicate a type of contact lens to use.

18. The osmolarity measuring system of claim 10, further comprising a base unit to include the processing device.

19. The osmolarity measuring system of claim 18, wherein the base unit is configured to include the measurement chamber.

20. The osmolarity measuring system of claim 18, wherein the base unit is configured to receive a cartridge that includes the measurement chamber.

21. The osmolarity measuring system of claim 20, wherein the measurement chamber is configured to be disposable.

22. The osmolarity measuring system of claim 21, further comprising a pair of electrodes in the measurement chamber.

23. The osmolarity measuring system of claim 18, wherein the base unit further comprises a network interface.

24. The osmolarity measuring system of claim 23, wherein the processor is configured to download the plurality of osmolarity measurements through the network interface.

25. A test kit comprising:  
a set of contact lenses; and  
an osmolarity measuring system, the osmolarity system comprising:

a measurement chamber configured to receive a volume of fluid and to receive a contact lens, the contact lens configured to carry a certain amount of tear film,

a series of electrodes configured to measure the electrical properties of fluid in the measurement chamber, and

a processing device coupled to the series of electrodes, the processing device configured to detect a change in the electrical properties of the fluid in the measurement chamber when a lens is placed in the measurement chamber.

26. The test kit of claim 25, wherein the processing device is configured to correlate the change in electrical properties with an osmolarity measurement.

27. The test kit of claim 26, wherein the osmolarity measurement system further comprises a plurality of electrode pairs, the plurality of electrode pairs configured to measure the electrical properties of the fluid.

28. The test kit of claim 27, wherein the pair of electrodes is configured to avoid direct contact with the contact lens when the contact lens is placed in the measuring chamber.

29. The test kit of claim 25, wherein detecting a change in the electrical properties comprises measuring the electrical conductivity of the fluid.

30. The test kit of claim 25, wherein the fluid is deionized water.

31. The test kit of claim 26, wherein the osmolarity measuring system further comprises a display coupled with the processing device,

wherein the processing device is further configured to display the osmolarity measurement on the display.

32. The test kit of claim 26, wherein the osmolarity measurement system further comprises a memory coupled with the processing device, the memory configured to store a table that maps electrical properties with osmolarity values, and wherein the processor is configured to correlate the change in electrical properties with an osmolarity value using the table.

33. The test kit of claim 32, wherein the table is configured to account for a baseline osmolarity associated with the volume of fluid that the measurement chamber is configured to receive.

34. The test kit of claim 33, wherein the memory is configured to store a plurality of osmolarity measurements.

35. The test kit of claim 34, wherein the memory is removable.

36. The test kit of claim 34, wherein the processor is further configured to track trends in the plurality of osmolarity measurements.

37. The test kit of claim 36, wherein the osmolarity measuring system further comprises an indicator to tell the user to select a new contact lens from the set of contact lenses.

38. The test kit of claim 37, wherein the indicator comprises at least one of a display, an LED, a plurality of lights, or an auditory signal.

39. The test kit of claim 38, wherein the set of contact lenses further comprises an array of coded packages, and wherein each of the packages in the array of coded packages is configured to include contact lenses with different properties than those associated with the contact lenses in the other packages in the array.

40. The test kit of claim 39, wherein the contact lens properties include porosity, composition, and stiffness, contact lens design parameters that can be modulated to varying tear film osmolarities.

41. The test kit of claim 39, wherein the indicator can be configured to indicate which package of the array of coded packages should be used.

42. A test kit comprising:  
a set of artificial tear solutions an osmolarity measuring system;  
and  
an osmolarity measuring system, the osmolarity system comprising:

a measurement chamber configured to receive a volume of fluid and to receive a contact lens, the contact lens configured to carry a certain amount of tear film,

a series of electrodes configured to measure the electrical properties of fluid in the measurement chamber, and

a processing device coupled to the series of electrodes, the processing device configured to detect a change in the electrical properties of the fluid in the measurement chamber when a lens is placed in the measurement chamber.

43. The test kit of claim 42, wherein the processing device is configured to correlate the change in electrical properties with an osmolarity measurement.

44. The test kit of claim 43, wherein the osmolarity measurement system further comprises a plurality of electrode pairs, the plurality of electrode pairs configured to measure the electrical properties of the fluid.

45. The test kit of claim 44, wherein the pair of electrodes is configured to avoid direct contact with the contact lens when the contact lens is placed in the measuring chamber.

46. The test kit of claim 42, wherein detecting a change in the electrical properties comprises measuring the electrical conductivity of the fluid.

47. The test kit of claim 42, wherein the fluid is deionized water.

48. The test kit of claim 43, wherein the osmolarity measuring system further comprises a display coupled with the processing device,



wherein the processing device is further configured to display the osmolarity measurement on the display.

49. The test kit of claim 43, wherein the osmolarity measurement system further comprises a memory coupled with the processing device, the memory configured to store a table that maps electrical properties with osmolarity values, and wherein the processor is configured to correlate the change in electrical properties with an osmolarity value using the table.

50. The test kit of claim 49, wherein the table is configured to account for a baseline osmolarity associated with the volume of fluid that the measurement chamber is configured to receive.

51. The test kit of claim 50, wherein the memory is configured to store a plurality of osmolarity measurements.

52. The test kit of claim 51, wherein the memory is removable.

53. The test kit of claim 51, wherein the processor is further configured to track trends in the plurality of osmolarity measurements.

54. The test kit of claim 53, wherein the osmolarity measuring system further comprises an indicator to tell the user to select a new artificial tear solution from the set of artificial tear solutions.

55. The test kit of claim 54, wherein the indicator comprises at least one of a display, an LED, a plurality of lights, or an auditory signal.

56. The test kit of claim 55, wherein the set of artificial tear solutions further comprises an array of coded packages, and wherein each of the packages in the array of coded packages is configured to include artificial tear solutions with different properties than those associated with the artificial tear solutions in the other packages in the array.

57. The test kit of claim 56, wherein the artificial tear solutions properties include: isotonic, hypotonic, and hypertonic properties, formulation characteristics that can be designed to address varying tear film osmolarities.

58. The test kit of claim 56, wherein the indicator can be configured to indicate which package of the array of coded packages should be used.

59. A test kit comprising:

a set of medications.

an osmolarity measuring system, the osmolarity system comprising:

a measurement chamber configured to receive a volume of fluid and to receive a contact lens, the contact lens configured to carry a certain amount of tear film,

a series of electrodes configured to measure the electrical properties of fluid in the measurement chamber, and

a processing device coupled to the series of electrodes, the processing device configured to detect a change in the electrical properties of the fluid in the measurement chamber when a lens is placed in the measurement chamber.

60. The test kit of claim 59, wherein the processing device is configured to correlate the change in electrical properties with an osmolarity measurement.

61. The test kit of claim 60, wherein the osmolarity measurement system further comprises a plurality of electrode pairs, the plurality of electrode pairs configured to measure the electrical properties of the fluid.

62. The test kit of claim 61, wherein the pair of electrodes is configured to avoid direct contact with the contact lens when the contact lens is placed in the measuring chamber.

63. The test kit of claim 59, wherein detecting a change in the electrical properties comprises measuring the electrical conductivity of the fluid.

64. The test kit of claim 60, wherein the fluid is deionized water.

65. The test kit of claim 60, wherein the osmolarity measuring system further comprises a display coupled with the processing device,

wherein the processing device is further configured to display the osmolarity measurement on the display.

66. The test kit of claim 60, wherein the osmolarity measurement system further comprises a memory coupled with the processing device, the memory configured to store a table that maps electrical properties with osmolarity values, and wherein the processor is configured to correlate the change in electrical properties with an osmolarity value using the table.

67. The test kit of claim 66, wherein the table is configured to account for a baseline osmolarity associated with the volume of fluid that the measurement chamber is configured to receive.

68. The test kit of claim 67, wherein the memory is configured to store a plurality of osmolarity measurements.

69. The test kit of claim 68, wherein the memory is removable.

70. The test kit of claim 68, wherein the processor is further configured to track trends in the plurality of osmolarity measurements.

71. The test kit of claim 70, wherein the osmolarity measuring system further comprises an indicator to tell the user to select a new medication from the set of medications.

72. The test kit of claim 71, wherein the indicator comprises at least one of a display, an LED, a plurality of lights, or an auditory signal.

73. The test kit of claim 72, wherein the set of medications further comprises an array of coded packages, and wherein each of the packages in the array of coded packages is configured to include medications with different properties than those associated with the medications in the other packages in the array.

74. The test kit of claim 73, wherein the artificial tear solutions properties include isotonic, hypotonic, and hypertonic properties.

75. A method for configuring an osmolarity testing device comprising the steps of:

determining a volume of a fluid to be used when testing osmolarity using the osmolarity testing device;

measuring electrical properties associated with the determined fluid volume; and

establishing a baseline osmolarity value for the osmolarity testing device based on the measured electrical properties associated with the determined fluid volume.

76. The method of claim 75 wherein the volume of fluid is determined based on the dimensions of a measuring chamber that comprises a part of the osmolarity measuring device.

77. The method of claim 75, wherein measuring electrical properties associated with the determined fluid volume comprises measuring an electrical conductivity of the volume of fluid.

78. The method of claim 77, wherein measuring the electrical conductivity comprises providing a plurality of electrodes within the measuring chamber, and bringing the liquid in contact with the plurality of electrodes.

79. The method of claim 78, further comprising applying a current to the liquid through the plurality of electrodes.

80. The method of claim 79, further comprising coupling a processing device to the measurement device to measure the electrical properties of the liquid.

81. The method of claim 80, further comprising displaying the baseline osmolarity value on a visible display.

82. The method of claim 80, further comprising storing the electrical conductivity value on a memory device.

83. The method of claim 82, further comprising providing a base unit to include the processing device and the memory device.

84. The method of claim 75, further comprising providing a table that maps measured electrical properties to osmolarity values.

85. The method of claim 84, wherein the table is configured to account for the established baseline osmolarity value.

86. A method for measuring the osmolarity of a sample provided by a user, the method comprising the steps of:

removing a contact lens;  
placing the contact lens in an aliquot of fluid;  
measuring the electrical properties of the fluid.

87. The method of claim 86, further comprising correlating the electrical properties of the fluid with an osmolarity measurement.

88. The method of claim 87, further comprising providing a table that maps measured electrical properties to an osmolarity value.

89. The method of claim 88, further comprising storing the osmolarity value on a memory device.

90. The method of claim 89, further comprising storing a plurality of osmolarity values on the memory device.

91. The method of claim 90, further comprising placing a measurement chamber comprising the aliquot of fluid in a base unit.

92. The method of claim 91, further comprising pouring the aliquot of fluid into the measurement chamber.

93. The method of claim 92, further comprising measuring the electrical properties of the aliquot of fluid before placing the lens in the aliquot of fluid to establish a baseline value for the electrical properties of the aliquot of fluid.

94. The method of claim 93, further comprising comparing the baseline value for the electrical properties of the aliquot of fluid to the measured electrical properties of the aliquot of fluid after placing the lens in the aliquot of fluid.

95. The method of claim 94, further comprising applying current to the aliquot of fluid through a plurality of electrodes.

96. The method of claim 87, further comprising displaying the osmolarity measurement on a visible display.

97. The method of claim 90, further comprising tracking trends in the plurality of osmolarity values on the memory device.

98. The method of claim 97, further comprising receiving an indication to perform an action.

99. The method of claim 98, further comprising receiving an indication to administer artificial tears.

100. The method of claim 98, further comprising receiving an indication to select a medication.

101. The method of claim 98, further comprising receiving an indication to select a new lens.